

## Claims

- [c1] 1.A method for increasing total oil level in a seed comprising:  
(A) transforming a plant with a nucleic acid construct that comprises as operably linked components, a promoter, a structural nucleic acid sequence capable of modulating the level of *FAD2* mRNA or FAD2 protein; and  
(B) growing said plant.
- [c2] 2.The method for increasing total oil level in a seed according to Claim 1, wherein said plant is *Arabidopsis*.
- [c3] 3.The method for increasing total oil level in a seed according to Claim 1, wherein said plant is corn.
- [c4] 4.The method for increasing total oil level in a seed according to Claim 1, wherein said plant is canola.
- [c5] 5.The method for increasing total oil level in a seed according to Claim 1, wherein said promoter is a seed specific promoter.
- [c6] 6.The method for increasing total oil level in a seed according to Claim 5, wherein said seed specific promoter is selected from the group consisting of napin promoter,

soybean trypsin inhibitor promoter, ACP promoter, stearoyl-ACP desaturase promoter, soybean  $\alpha'$  subunit of  $\beta$ -conglycinin promoter, oleosin promoter,  $\beta$ -conglycinin promoter, maize globulin-1 gene promoter, and zein promoter.

- [c7] 7. The method for increasing total oil level in a seed according to Claim 1, wherein the level of total protein remains essentially unchanged in said seed as compared to a seed from a second plant lacking said nucleic acid construct.
- [c8] 8. The method for increasing total oil level in a seed according to Claim 1, wherein the level of oleic acid is increased and the level of linoleic acid is decreased in said seed as compared to a seed from a second plant lacking said nucleic acid construct.
- [c9] 9. The method for increasing total oil level in a seed according to Claim 1, wherein the percentage of total oil in said seed is increased as compared to a seed from a second plant lacking said nucleic acid construct.
- [c10] 10. A method for increasing total oil in a seed comprising:  
(A) transforming a plant with a nucleic acid construct that comprises as operably linked components, a pro-

moter, a structural nucleic acid sequence capable of increasing the level of oleic acid; and  
(B)growing said plant.

[c11] 11. A chimeric gene comprising the nucleic acid fragment selected from the group consisting of SEQ ID NOS: 1, 4, 7-11, 14, 19, 22, 25 and 26 or the reverse complement thereof, any functionally equivalent subfragment thereof or the reverse complement of said fragment or subfragment wherein said fragments are operably linked and further wherein expression of the chimeric gene results in an increase in total oil.

[c12] 12. A method for increasing total oil level in a seed comprising:

(A) transforming a plant with a nucleic acid construct that comprises as operably linked components, a promoter, a sequence selected from the group consisting of SEQ ID NOS: 1, 4, 7-11, 14, 19, 22, 25 and 26 or the reverse complement thereof, any functionally equivalent subfragment thereof or the reverse complement of said fragment or subfragment; and

(B) growing said plant.

[c13] 13.The method for increasing total oil level in a seed according to Claim 12, wherein said plant is *Arabidopsis*.

- [c14] 14.The method for increasing total oil level in a seed according to Claim 12, wherein said plant is corn.
- [c15] 15.The method for increasing total oil level in a seed according to Claim 12, wherein said plant is canola.
- [c16] 16.The method for increasing total oil level in a seed according to Claim 12, wherein said promoter is a seed specific promoter.
- [c17] 17.The method for increasing total oil level in a seed according to Claim 16, wherein said seed specific promoter is selected from the group consisting of napin promoter, soybean trypsin inhibitor promoter, ACP promoter, stearyl-ACP desaturase promoter, soybean a' subunit of b-conglycinin promoter, oleosin promoter,  $\beta$ -conglycinin promoter, maize globulin-1 gene promoter, and zein promoter.
- [c18] 18.The method for increasing total oil level in a seed according to Claim 13, wherein the level of total protein remains essentially unchanged in said seed as compared to a seed from a second plant lacking said nucleic acid construct.
- [c19] 19.The method for increasing total oil level in a seed according to Claim 13, wherein the level of oleic acid is increased and the level of linoleic acid is decreased in said

seed as compared to a seed from a second plant lacking said nucleic acid construct.

[c20] 20. The method for increasing total oil level in a seed according to Claim 13, wherein the percentage of total oil in said seed is increased as compared to a seed from a second plant lacking said nucleic acid construct.